Written Statement

For

Proposed Rulemaking
California Code of Regulations
Title21, Public Works
Department of Transportation

3M

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3M is a strong proponent of using the ISO18000-63 (6C) standard in tolling. As an open international standard, 6C, has seen strong momentum in tolling inside and outside the U.S.

- North Carolina Turnpike Authority requested that 6C support be added in its latest RFP. Production is estimated to be 2017.
- State Road and Tollway Authority in Georgia is scheduled to support 6C in production in 2017.
- Washington DOT, Utah DOT, and Colorado DOT rolled out 6C support in 2012.
- Louisiana introduced 6C in 2015.
- Malaysia started to convert to 6C in 2016.
- Vietnam converted to 6C in 2015.
- The Philippines converted to 6C in 2015.
- Taiwan converted to 6C in 2014.
- Turkey converted to 6C in 2012.
- Most Latin America countries have introduced 6C to phase out their legacy tolling protocols.

Additionally, several countries and regions in Asia are actively evaluating 6C to replace their current technologies.

Several factors contribute to this trend of strong global adoption:
- Proven experience and performance to handle high speed open road tolling or stop-n-go tolling.
- The availability of multiple reader and tag suppliers leads to the opportunity for ongoing cost reduction and performance improvement.
- Significantly reduced tag costs enable tolling agencies to encourage faster and wider adoptions among drivers and thus shorten the ROI period on their investment.
- Greatly reduced weight and thickness lowers mailing costs significantly.
- Passive tags eliminate the headaches and costs around battery replacement. Tag disposal is also not an issue.

3M would like to provide comments for some of the typical concerns.

1) With a plethora of reader and tag suppliers, how do agencies ensure all products meet certain levels of quality?

Different suppliers can introduce different levels of performance or quality. 3M recommends the California Toll Operators Committee establish performance and quality metrics through disciplined testing and analysis, and work with an independent third party organization (such as OmniAir) to use their certification as a requirement for interested suppliers. Pursuing these activities in cooperation with other tolling agencies helps ensure uniformity of requirements which can help ensure a competitive and diverse supply of solutions.

2) Is there a significant concern about 6C tags' security risks?

6C is a technology platform. Different types of security schemes can be constructed on top of it. The key is to balance the required level of investment and potential risks of security breach. The likelihood of a security breach itself is a balance of how difficult it is to perform that breach and the cost of doing so vs. what are the benefits and risks of being caught.

In the current age of malicious actors, every toll solution using RFID technology should have the means of authenticating the tag. A good authentication scheme will significantly raise the cost barrier to counterfeit a tag. For example the 6C Toll Operators Coalition authentication scheme utilizes information encoded into the tag chip at the foundry, and the only way to duplicate this information is via use of a device which can emulate a tag (a blank 6C tag cannot be used for this purpose). There is very expensive test equipment available that could do this, but the cost is significantly more than the value obtained by circumventing a toll transaction, and it is unclear whether such a piece of test equipment would interact properly with a toll system.

License plate recognition cameras are typically used in toll systems and a counterfeit tag will not have an appropriate license plate number-to-tag identifier association. The license plate of the vehicle utilized for malicious activity can be used to identify the perpetrator.

Lastly, counterfeiting of the license plate itself is likely to have more economic benefit to the malicious actor than counterfeiting a toll tag since it could be used to evade a broader range of costs and fees associated with the vehicle.

Overall, 3M considers the security risk associated with 6C tags as low when used with an authentication scheme. Inside the U.S., DOTs in Colorado, Washington, and Utah have been operating 6C since 2012. Globally, India has been distributing more than two million 6C tags every year. 3M is not aware of any security incidents associated with a 6C deployment.

3) Should I be concerned about potential privacy violations with 6C tags?

Since the RFID tags provide an identifier and best practice dictates that no personally identifying information be encoded into the tag, privacy violations are not a concern. An RFID tag placed onto a vehicle is no different than a license plate. Low cost 6C readers are available in the marketplace and the range of such products is typically less than the range of human eyesight in reading a license plate number.

4) Will the integration cost be so high that cost savings on 6C is not enough to justify the conversion?

There are two major integration-related costs in order to determine this. First, there is the cost of the physical equipment. If existing readers already support 6C, there might not be a need to purchase any new equipment. If not, new readers, antennas, as well a labor costs should be budgeted. Second, there is the cost of the lane integration project. 3M recommends Caltrans consider the following factors that might potentially lower costs:

- Ensure each stakeholder is motivated to ensure the conversion is a success and ensure capable oversight will be in place during the pilot activities.
- Integrate new protocol at the lowest layer of the solution architecture in order to minimize or eliminate impact at higher layers. Minimizing the impact on the backend should help reduce the integration costs.
- Caltrans should actively request existing suppliers to provide their reader interface documentation to help reduce costs.

The 6C technology has been successfully integrated into many installations, including those migrating from legacy technologies. Once the integration is completed and all solutions are put into production, 3M doesn't anticipate the maintenance and support costs for 6C will be higher than those of T21 solutions.

5) IP landscape

Each vendor has the opportunity to develop an IP strategy that best fits their business and customer needs. Caltrans may consider placing an obligation on suppliers to make any IP held against the technology available on fair, reasonable, and non-discriminatory basis.   Caltrans should evaluate the 6C IP landscape and, if there is any concern or uncertainty, Caltrans can consider requesting that suppliers offer indemnification and/or discussing with stakeholders to ensure a smooth 6C introduction.

3M can work with Caltrans to balance the risks in a complex but manageable IP landscape.